

Atty. Docket No. CEHR 03-13 02  
Appl. No. 10/744,639  
Amdt. dated July 8, 2005  
Reply to Office action of June 24, 2005

**PATENT****Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (cancelled)

Claim 2 (previously presented): The system of Claim 9, wherein the recirculating apparatus comprises:

a water reservoir;

a water quality sensor; and

a pump for pumping the water from the water reservoir through the water quality sensor and into the exposure chamber.

Claim 3 (original): The system of Claim 2, wherein the recirculating apparatus further comprises:

a water distribution manifold for dividing the water before it enters the exposure chamber.

Claim 4 (original): The system of Claim 2, wherein the water quality sensor senses a characteristic of water supplied to the exposure chamber, wherein the controller is responsive to the water quality sensor by comparing the water characteristic with the corresponding behavioral signal to determine when a change in

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one or more of the ventilatory parameters occurred at the approximate time that a change in water characteristic occurred.

Claim 5 (original): The system of Claim 4, wherein the water characteristic includes dissolved oxygen level and temperature.

Claim 6 (previously presented): A portable system for monitoring and evaluating water quality using ventilatory behavior and body movement of an aquatic organism, comprising:

- an exposure chamber for housing an aquatic organism;
- a water inlet for directing water to the exposure chamber;
- an electrode for sensing and quantifying ventilatory behavior and body movement of said aquatic organism into data and outputting said data as a behavioral signal;
- a controller for receiving the behavioral signal and determining a plurality of ventilatory parameters based on the behavioral signal;
- a recirculating apparatus for recirculating water to the exposure chamber, the recirculating apparatus comprising a water reservoir, a water quality sensor and a pump for pumping the water from the water reservoir through the water quality sensor and into the exposure chamber; and
- a first portable housing;
- wherein the exposure chamber, electrode, water reservoir and pump are disposed within the first housing.

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Claim 7 (original): The system of Claim 6, wherein the water quality sensor is pivotally attached to the exterior of the first housing via a calibration bracket.

Claim 8 (original): The system of Claim 6, further comprising:  
a second portable housing in communication with the first portable housing; and  
electrical components disposed within the second housing;  
wherein the water quality sensor is pivotally attached to the exterior of the first housing and the second housing.

Claim 9 (currently amended): A portable system for monitoring and evaluating water quality using ventilatory behavior and body movement of an aquatic organism, comprising:  
an exposure chamber for housing an aquatic organism;  
a water inlet for directing water to the exposure chamber;  
an electrode for sensing and quantifying ventilatory behavior and body movement of said aquatic organism into data and outputting said data as a behavioral signal;  
a controller for receiving the behavioral signal and determining a plurality of ventilatory parameters based on the behavioral signal;  
a recirculating apparatus for recirculating water to the exposure chamber;  
and

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a heater/chiller unit for controlling a temperature of water being tested by the system.

Claim 10 (previously presented): The system of Claim 9, further comprising:  
a backup aeration device for preventing suffocation of the aquatic organism in the case of water loss from the system or electrical failure of the system.

Claim 11 (currently amended): The system of Claim 9, wherein the controller further determines when one or more of the parameters exceed a threshold.

Claim 12 (currently amended) The system of claim 9, wherein the controller determines ventilatory frequency, average ventilatory depth, and cough rate of the organism based on the behavioral signal.

Claim 13 (previously presented): The system of Claim 9, further comprising:  
a water sampler responsive to the controller for automatically sampling water supplied to the exposure chamber for subsequent analysis.

Claim 14 (previously presented): The system of Claim 9, wherein the exposure chamber is supplied with water to be discharged into the environment, including means for directing the water into a holding tank when the controller determines that one or more of the ventilatory parameters exceed a threshold.

Claim 15 (previously presented): The system of Claim 9, wherein the exposure chamber includes a plurality of compartments, each of which can house an aquatic organism.

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Claim 16 (currently amended): The system of Claim 9, wherein the aquatic organism is a fish.

Claim 17-27 (cancelled)

Claim 28 (currently amended): [[The portable apparatus of claim 27 wherein said water quality sensor is]] A portable apparatus for generating behavioral signals of aquatic organisms indicative of water quality, comprising:

a first portable housing including a water inlet;

an exposure chamber disposed within said first portable housing for housing an aquatic organism, said exposure chamber having an inlet and an outlet;

an electrode disposed within said exposure chamber for sensing and quantifying ventilatory behavior and body movement of said aquatic organism into data and outputting said data as a behavioral signal;

an amplifier for amplifying the behavioral signal; and

a recirculation unit that circulates water from the outlet of said exposure chamber, through a fluid flow path and to the inlet of said exposure chamber, said recirculation unit including:

a water reservoir in fluid communication with said exposure chamber, the water reservoir including an inlet and an outlet;

a water quality sensor in fluid communication with said water reservoir and said exposure chamber, said water quality sensor being pivotally mounted to said first portable housing;

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a pump disposed between said water reservoir and said water quality sensor to assist fluid flow between from the water reservoir to the water quality sensor.

Claim 29 (previously presented): The system of claim 28 wherein said water reservoir and said pump are disposed within said first portable housing.

Claim 30 (previously presented): The system of claim 29 further comprising a second portable housing disposed contiguous to said first portable housing, said amplifier being disposed in said second portable housing.

Claim 31 (previously presented): The system of claim 30 further comprising a bracket mounted to said first and second portable housings, said bracket including a plate and an adjustable clamp pivotally mounted to the plate configured to hold said water quality sensor.